

***Perenniporia puerensis* sp. nov. from southern China**

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ABSTRACT—A new polypore, *Perenniporia puerensis*, collected from Yunnan province, southern China, is described and illustrated based on four collections using morphology-based methods. Macroscopically, the new species is characterized by an annual growth habit, resupinate basidiocarps with a yellow to ochraceous pore surface, and 4–6 pores per mm. Microscopically, it has a dimitic hyphal system with non-dextrinoid and cyanophilous skeletal hyphae that are encrusted with pale-yellow crystals, and basidiospores that are ovoid to subglobose, thick-walled, non-dextrinoid, cyanophilous, and $4.3\text{--}5.5 \times 3.7\text{--}4.7\text{ }\mu\text{m}$.

KEY WORDS—*Basidiomycota*, *Polyporaceae*, *Polyporales*, taxonomy, white rot fungus

Introduction

Perenniporia Murrill is a large, cosmopolitan genus characterized by poroid basidiomata and basidiospores that are thick-walled, ellipsoid to distinctly truncate, cyanophilous and variably dextrinoid and amyloid. The hyphal system in *Perenniporia* is di- or trimitic with clamp connections on the generative hyphae and vegetative hyphae that are cyanophilous and variably dextrinoid or amyloid (Decock & Stalpers 2006). Approximately one hundred species have been described in or transferred to the genus (Gilbertson & Ryvarden 1987; Decock & Ryvarden 1999; Hattori & Lee 1999; Decock et al. 2001; Núñez & Ryvarden 2001; Choeyklin et al. 2009; Cui & Zhao 2012; Zhao & Cui 2013a,b; Zhao et al. 2013; Ryvarden & Melo 2014; Jang et al. 2015; Decock 2016).

Phylogenetic studies of *Perenniporia* s.l. inferred from nuclear ribosomal LSU and ITS DNA sequence data well support several monophyletic groups that can be recognized as distinct genera (Robledo et al. 2009; Zhao & Cui 2013a,b; Zhao et al. 2013) within the polyporoid clade.

Fifty *Perenniporia* species have been recorded during recent taxonomic surveys in China (Dai et al. 2002, 2015; Dai 2012), including several new species (Cui et al. 2007; Xiong et al. 2008; Dai 2010; Dai et al. 2011; Cui & Zhao 2012; Zhao & Cui 2012, 2013a,b; Zhao et al. 2013, 2014). During one such recent survey, we identified an undescribed species matching the concept of *Perenniporia*.

Materials & methods

Cited specimens are deposited at the herbarium of Southwest Forestry University, Kunming, China (SWFC). Microscopical protocols follow Dai (2012). Sections were examined at magnifications up to 1000× using a Nikon Eclipse E 80i microscope and phase contrast illumination. Drawings were made with the aid of a drawing tube. Microscopic features, measurements, and drawings were made from slide preparations stained with Cotton Blue and Melzer's reagent. Spores were measured from sections cut from the tubes. To present spore size variations, 5% of measurements were excluded from each end of the range, and extreme values are given in parentheses. In the text the following abbreviations are used: M = Melzer's reagent, M- = both inamyloid and nondextrinoid, KOH = 5% potassium hydroxide, CB = Cotton Blue, CB+ = cyanophilous, L = mean spore length (arithmetic average of all spores), W = mean spore width (arithmetic average of all spores), Q = the range of variation in the L/W ratios of n number of basidiospores, n = number of basidiospores measured from the 4 specimens studied. Special color terms follow Petersen (1996).

Taxonomy

Perenniporia puerensis C.L. Zhao, sp. nov.

FIGS 1, 2

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Differs from *Perenniporia straminea* by its bigger pores and bigger basidiospores, from *P. tibetica* by its smaller pores and the absence of rhizomorphs; and from *P. subacida* by its annual growth habit, its non-dextrinoid skeletal hyphae, and its truncate basidiospores.

TYPE: China. Yunnan Province: Puer, Laiyanghe Nature Reserve, on a fallen angiosperm trunk, 21 November 2016, CLZhao 606 (Holotype, SWFC 000606).

ETYMOLOGY: The specific epithet *puerensis* (Lat.) refers to the locality (Puer) of the type specimen.

BASIDIOMATA annual, resupinate, adnate, without odor or taste when fresh, becoming corky upon drying, $\leq 5 \times 3$ cm, 2.5 mm thick at the center. Pore surface cream to buff when fresh, yellow to ochraceous upon drying; pores

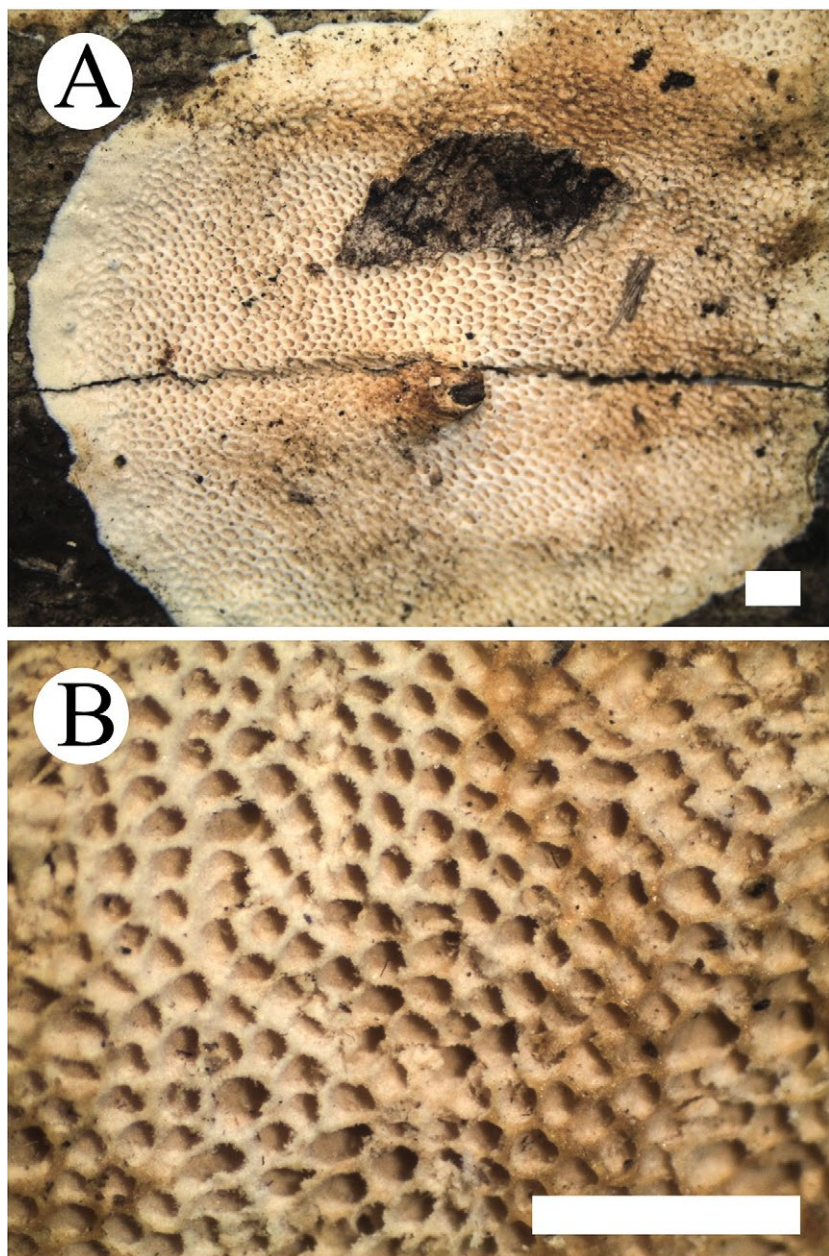


FIG. 1. *Perenniporia puerensis* (holotype, SWFC 000606): basidiomata. Scale bars = 1 cm.

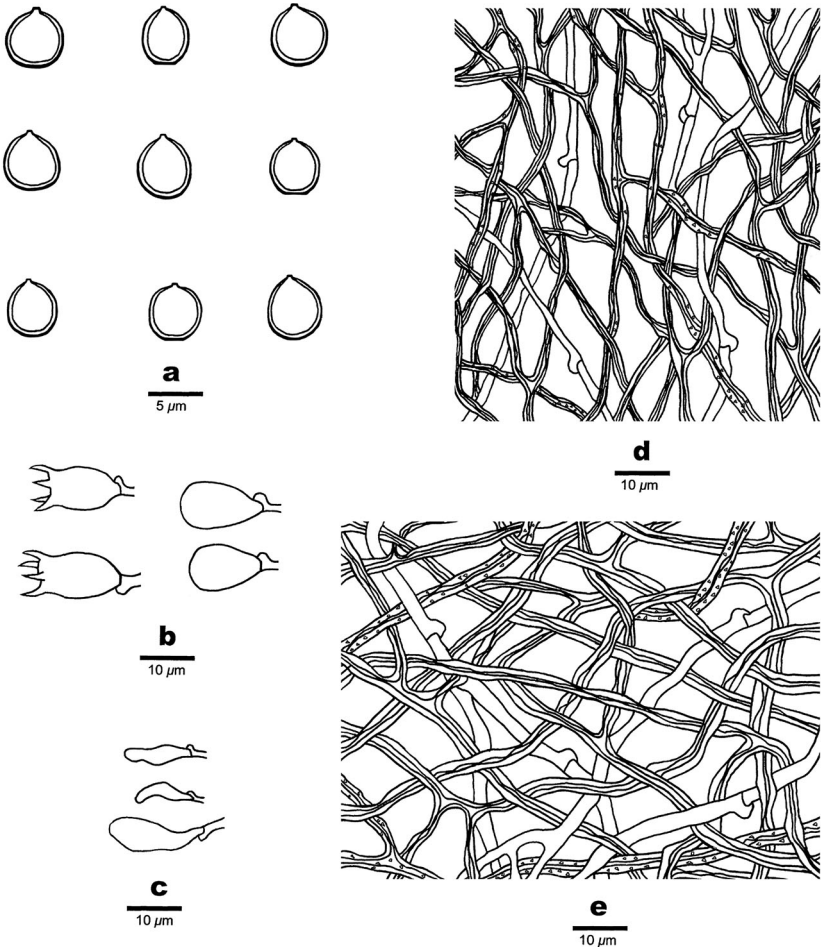


FIG. 2. *Perenniporia puerensis* (holotype, SWFC 000606). a. Basidiospores; b. Basidia and basidioles; c. Cystidioles; d. Hyphae from trama; e. Hyphae from subiculum. Scale bars: a = 5 µm; b–e = 10 µm.

round to angular, 4–6 per mm; dissepiments thin, entire. Sterile margin narrow, cream, ≤1 mm wide. Subiculum cream to buff, thin, ≤0.5 mm thick. Tubes concolorous with pore surface, corky, ≤2 mm long.

HYPHAL STRUCTURE dimitic; generative hyphae with clamp connections; skeletal hyphae M–, CB+; tissues unchanged in KOH and the pale-yellow crystals dissolving in KOH.

SUBICULUM generative hyphae infrequent, hyaline, thin-walled, frequently branched, 2–3.5 μm diam.; skeletal hyphae dominant, hyaline, thick-walled with a wide to narrow lumen, frequently branched, interwoven, 2.5–4.5 μm diam., encrusted with pale-yellow crystals.

TUBE generative hyphae infrequent, hyaline, thin-walled, frequently branched, 2–3 μm diam.; skeletal hyphae dominant, hyaline, thick-walled with a wide lumen, frequently branched, interwoven, 2–4 μm diam., encrusted with pale-yellow crystals. Cystidia absent, fusoid cystidioles present, hyaline, thin-walled, 10–16 $\times$ 2.5–5 μm . Basidia barrel-shaped, with four sterigmata and a basal clamp connection, 13–18 $\times$ 7–10 μm ; basidioles dominant, mostly pear-shaped, but slightly smaller than basidia.

BASIDIOSPORES ovoid to subglobose, either truncate or non-truncate, hyaline, thick-walled, smooth, non-dextrinoid, CB+, (4.1–)4.3–5.5(–5.7) $\times$ (3.5–)3.7–4.7(–5.1) μm , L = 4.95 μm , W = 4.18 μm , Q = 1.14–1.21 (n = 120/4).

TYPE OF ROT: white rot.

ADDITIONAL SPECIMENS EXAMINED: CHINA. YUNNAN PROVINCE. Puer: Laiyanghe Nature Reserve, on fallen angiosperm trunk, 21 November 2016, CLZhao 607 (SWFC 000607); CLZhao 608 (SWFC 000608); CLZhao 609 (SWFC 000609).

Discussion

Four other *Perenniporia* species were also found with *P. puerensis* in the same locality (Yunnan province, China): *P. aridula* B.K. Cui & C.L. Zhao, *P. bannaensis* B.K. Cui & C.L. Zhao, *P. piceicola* Y.C. Dai, and *P. russeimarginata* B.K. Cui & C.L. Zhao. *Perenniporia aridula* is distinguished by its perennial basidiomata and larger basidiospores (6–7 $\times$ 5.1–6 μm , Zhao et al. 2013); *P. bannaensis* is distinguished by its smaller pores (6–8 per mm), unbranched skeletal hyphae, and strongly dextrinoid basidiospores (Zhao et al. 2013); *P. piceicola* differs by larger basidiospores (11–14 $\times$ 5.4–7.5 μm) and the presence of pyriform cystidia (Dai et al. 2002); and *P. russeimarginata* is separated by its perennial basidiocarps with a white to cream pore surface and the distinct reddish brown sterile margin (Zhao & Cui 2013a).

The presence of both truncate and non-truncate basidiospores is reminiscent of two similar *Perenniporia* species—*P. straminea* (Bres.) Ryvarden and *P. tibetica* B.K. Cui & C.L. Zhao: *P. straminea* is distinguished by smaller pores (7–9 per mm) and basidiospores (3–4 $\times$ 2.5–3 μm ; Ryvarden 1988), while *P. tibetica* differs in its bigger pores (2–3 per mm) and presence of white to cream-colored rhizomorphs (Cui & Zhao 2012).

Perenniporia subacida (Peck) Donk, which resembles *P. puerensis* in pore size (4–6 per mm) and non-dextrinoid basidiospores, is distinguished by its

perennial basidiocarps, strongly dextrinoid skeletal hyphae, and non-truncate basidiospores (Núñez & Ryvarden 2001, Ryvarden & Melo 2014).

Polypores are an extensively studied group in *Basidiomycota* (Gilbertson & Ryvarden 1987, Núñez & Ryvarden 2001, Ryvarden & Melo 2014), but Chinese polypore diversity is still not well known, especially in the subtropics and tropics where many recently described taxa have been collected (Cui & Dai 2008; Cui et al. 2009, 2010, 2011; Du & Cui 2009; Li & Cui 2010; He & Li 2011; Jia & Cui 2011; Yu et al. 2013; Yang & He 2014; Chen et al. 2015). The new species *Perenniporia puerensis* is also from the subtropics. We anticipate that additional polypore taxa will be found in China after further investigation and molecular analyses.

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